

THAT WHICH IS CLAIMED:

1. An imaging device for simultaneous image capture and image display updating, the device comprising:

an imager for capturing image data upon aiming the imager at an image;

a central processing unit (CPU) that is in communication with the imager and issues commands to capture image data;

a direct memory access module in communication with the imager and the CPU that executes the commands to capture image data; and

a memory module in communication with the CPU and the DMA module, the memory module including a first image capture buffer that temporarily stores first-in-time captured image data prior to displaying first-in-time image data and a second image capture buffer that temporarily stores second-in-time captured image data prior to displaying second-in-time image data.

2. The image device of Claim 1, further comprising a display that displays to a user first-in-time image data followed by the display of second-in-time image data.

3. The image device of Claim 1, further comprising a field programmable gate array device that implements the direct memory access (DMA) module.

4. The image device of Claim 1, further comprising a means for enhancing image data stored in the first and second image capture buffers.

5. The image capture device of Claim 1, further comprising a means for re-formatting image data stored in the first and second image capture buffers.

6. The image device of Claim 4, wherein the memory module further includes an image display buffer that temporarily stores captured image data that has been enhanced prior to display.

7. A method for simultaneous image capture and image display in an imaging device, the method comprising the steps of:

capturing first-in-time image data to a first image capture buffer that is in communication with an imager;

5 capturing second-in-time image data to a second image capture buffer that is in communication with an imager; and

displaying the first-in-time image data on a display while the image device captures the second-in time image data to the second image capture buffer.

10 8. The method of Claim 7, further comprising the steps of:

capturing third-in-time image data to the first buffer once the first-in-time image data is displayed; and

displaying the second-in-time image data on a display while the image device captures the third-in-time image data to the first buffer.

15 9. The method of Claim 7, wherein capturing first-in-time image data to a first image capture buffer, further comprises the step of:

issuing, at a CPU, a capture command to a DMA module to capture first-in-time image data to the first image capture buffer;

20 queuing, at the DMA module, the capture command until the DMA module receives an end-of-frame signal;

executing, at the DMA module, the capture command to capture first-in-time image data to the first image capture buffer; and

25 transferring the first-in-time image data from the imager to the first image capture buffer.

10. The method of Claim 7, wherein capturing second-in-time image data to a second image capture buffer, further comprises the step of:

30 issuing, at a CPU, a capture command to a DMA module to capture second-in-time image data to the second image capture buffer;

queuing, at the DMA module, the capture command until the DMA module receives an end-of-frame signal;

executing, at the DMA module, the capture command to capture second-in-time image data to the second image capture buffer; and

5                   transferring the second-in-time image data from the imager to the second image capture buffer.

11.     The method of Claim 7, further comprising the step of enhancing the first-in-time image data after capture to the first image capture buffer and before displaying  
10     the first-in-time image data on the display.

12.     The method of Claim 7, further comprising the step of re-formatting the first-in-time image data after capture to the first image capture buffer and before  
15     displaying the first-in-time image data on the display.

13.     The method of Claim 7, further comprising the steps of enhancing the first-in-time image data after capture to the first image capture buffer and before  
displaying the first-in-time image data on the display and re-formatting the first-in-time  
20     image data after capture to the first image capture buffer and before displaying the first-in-time image data on the display.

14.     The method of Claim 8, wherein the step of capturing third-in-time image data to the first buffer once the first-in-time image data is displayed, further comprises the steps of:

25                   issuing, at a CPU, a capture command to a DMA module to capture third-in-time image data to the second image capture buffer in response to an EOF signal;

                  queuing, at the DMA module, the capture command until the DMA module receives an EOF signal;

                  executing, at the DMA module, the capture command to capture third-in-  
30     time image data to the first image capture buffer; and

transferring the third-in-time image data from the imager to the first image capture buffer.

15. A method for simultaneous image capture and image display in an  
5 imaging device, the method comprising the steps of:

issuing a first command to capture first-in-time image data to a first image capture buffer;

issuing a second command to capture second-in-time image data to a  
second image capture buffer;

10 executing the first capture command;  
signaling end-of-frame (EOF) upon the completion of capturing the first-in-time image data to the first image capture buffer;

issuing a third command to capture third-in-time image data to the first image capture buffer;

15 executing the second capture command; and  
displaying the first-in-time image data to an imaging device display while the imager executes the second command to capture second-in-time image data to the second image capture buffer.

20 16. The method of Claim 15, further comprising the steps of:

signaling end-of-frame (EOF) upon the completion of capturing the second-in-time image data to the second image capture buffer;

issuing a fourth command to capture fourth-in-time image data to the second image capture buffer;

25 executing the third capture command; and  
displaying the second-in-time image data to the imaging device display while the imager executes the third command to capture third-in-time image data to the first image capture buffer.

17. The method of Claim 15, further comprising the step of enhancing the first-in-time image data that is stored in the first image capture buffer prior to displaying the first-in-time image data on the image device display.

5 18. The method of Claim 17, further comprising the step of storing the enhanced first-in-time image data in an image display buffer prior to displaying the first-in-time image data on the image device display.

10 19. The method of Claim 15, further comprising the step of reformatting the first-in-time image data that is stored in the first image capture buffer prior to displaying the first-in-time image data on the image device display.

15 20. The method of Claim 19, further comprising the step of storing the reformatted first-in-time image data in an image display buffer prior to displaying the first-in-time image data on the image device display.

20 21. The method of Claim 15 further comprising the steps of enhancing the first-in-time image data that is stored in the first image capture buffer prior to displaying the first-in-time image data on the image device display and reformatting the first-in-time image data that is stored in the first image capture buffer prior to displaying the first-in-time image data on the image device display.

25 22. The method of Claim 16, further comprising the step of enhancing the second-in-time image data that is stored in the second image capture buffer prior to displaying the second-in-time image data on the image device display.

30 23. The method of Claim 22, further comprising the step of storing the enhanced second-in-time image data in an image display buffer prior to displaying the second-in-time image data on the image device display.

24. The method of Claim 16, further comprising the step of reformatting the second-in-time image data that is stored in the second image capture buffer prior to displaying the second-in-time image data on the image device display.

5 25. The method of Claim 24, further comprising the step of storing the reformatted second-in-time image data in an image display buffer prior to displaying the second-in-time image data on the image device display.

10 26. The method of Claim 16 further comprising the steps of enhancing the first-in-time and second-in-time image data that is stored in the first and second image capture buffers, respectively, prior to displaying the first-in-time and second-in-time image data on the image device display, respectively and reformatting the first-in-time and second-in-time image data that is stored in the first and second image capture buffer, respectively, prior to displaying the first-in-time and second-in-time image data on the  
15 image device display. respectively.

20 27. The method of Claim 26, further comprising the step of storing the enhanced and reformatted first-in-time and second-in-time image data in an image display buffer prior to displaying the first-in-time and second-in-time image data on the image device display.